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# THE RHODE ISLAND MEDICAL JOURNAL

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VOLUME X    Whole No. 218

PROVIDENCE, R. I., NOVEMBER, 1927

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## ORIGINAL ARTICLES

### THE TREATMENT OF EPILEPSY OF CHILDHOOD BY THE KETOGENIC DIET\*

FRITZ B. TALBOT, M.D.  
BOSTON, MASS.

**INTRODUCTION.** Epilepsy has been known for many centuries, and has counted among its victims several of the famous characters in history. It is one of the conditions which is not fully understood, and, as a consequence, no specific treatment has been developed for the group of symptoms which bears its name. Numerous widely varying types of cures have been advocated, praised, and eventually discarded. Surgery has given relief in some instances, but drugs and various forms of diet have been the main form of therapy used in most instances. The greatest success has been claimed for luminal, which has largely displaced the bromides. The interest in the low-protein diet and salt-free diets has diminished, and although the various methods of treatment have all been attended with some measure of success, the proportion of failures have been so great that any treatment which gives better results is welcome.

The latest and most promising method of treatment is by means of what is known as the ketogenic diet, which causes the formation of acetone and other ketones. It is the object of this paper to describe this diet in detail, but before taking it up, fasting and its relation to the diet will be mentioned briefly. Fasting in the treatment of epilepsy is mentioned in the Bible, Mark IX, 17-29. An epileptic boy was brought to Christ, who cast out the evil spirit which was tormenting him. When asked by his disciples why they had been unable to do the same thing, Christ said, "This kind can come forth by nothing but prayer and

fasting." Twenty-four children underwent various periods of fasts in the Children's Clinic of the Massachusetts General Hospital with relief of symptoms during the fast,<sup>1</sup> but in all cases the administration of food was followed by a return of the attacks within a few days or weeks. The ketogenic diet was then instituted, and it was found that the same chemical changes took place in the body as did during fast. The most striking changes were a lowered blood sugar, a moderate ketosis-acidosis as shown by a large amount of acetone in the blood, breath, and urine, and a slightly lowered carbone-dioxide combining power of the blood.<sup>2</sup> It was thought that the clinical improvement was due to some of these chemical changes. Although it is not clear which factor is responsible for this, it is possible that the anaesthetic action of acetone may be the cause of the improvement.

Body heat and energy are obtained by the oxidation of fat, carbohydrate, and protein. Carbohydrate is necessary for the complete oxidation of fat, and if sugar is not present in sufficient amounts, the metabolism of fat only progresses to the stage of ketones. So far as we are concerned, this happens during fasting when the carbohydrate reserve of the body is used up, and on the ketogenic diet when the carbohydrate in the food is so reduced and the fat increased that there is not enough carbohydrate to burn up the fat. The antiketogenic element is found principally in carbohydrate and the ketogenic element is mainly in fat. So long as the proportion of ketogenic food as compared to the antiketogenic food is less than  $1\frac{1}{2}:1$  a ketosis will not develop, but when it is 2 or more to 1 a ketosis is to be expected. The ketogenic diets are estimated in amounts of the different foods by weight. The methods used by us are similar to those used by Wilder, Helmholtz, and Peterman.<sup>3</sup>

**THE RESULTS OF THIS METHOD OF TREATMENT.** Of the cases treated in the Children's Clinic of the Massachusetts General Hospital, the Mayo Clinic, and a few in private practice, a total of about 200 children, complete symptomatic re-

\*Read before the Rhode Island Medical Society at the Annual Meeting, June 2d, 1927.

lief has been obtained in 33 per cent., while definite improvement has been observed in one-half to three-quarters of those who followed the diet consistently.

At first it was thought that improvement could only be expected in so-called idiopathic epilepsy, but it has also been obtained in children with definite pathology of the brain, such as cerebral palsy and encephalitis. The cases in which there is complete relief of symptoms are about equally divided between those suffering with grand mal and those with petit mal.

The age of the patient seems to have a definite relation to the proportion of so-called cures. Dr. Luther has divided the cases at the Massachusetts General Hospital according to age, and has found that treatment is most effective when started in children before puberty, and that a greater proportion of failures occurred in subjects in whom treatment was started later. No statistics are available as to the proportion of "cures" that are to be expected in the adult, but a few cases have been said to have completely been relieved.

It is difficult to say what should be included as a cure. Some cases are free so long as they abstain from carbohydrate, but have attacks whenever they break the diet. An example of this is a boy of the Massachusetts General Hospital group who had been free from attacks for fifteen months. He then ate considerable amounts of candy, and the attacks returned. They were quickly relieved by returning to a strict diet. Such cases apparently can be kept free from attacks so long as they refrain from extra carbohydrate. Many cases have now been entirely free from attacks for several months. The longest freedom is in a case of Helmholtz's which has had no attack for three years and ten months.

**THE DIET.** Fat is roughly 100 per cent. ketogenic, carbohydrate 100 per cent. antiketogenic, and protein is about half and half. The foods are figured in grams of cooked food and weighed out on scales just as they are in the treatment of diabetes. The proportions of ketogenic to the antiketogenic foods of the usual normal diet are about 1:4.<sup>4</sup> The patient is first put on a 1½:1 diet, which is a marked increase in fat and decrease in carbohydrate. The proportions are such, however, that the ketones, acetone, B-oxybutyric acid and diacetic acid should not appear in the urine.

This diet may be given for ten days to two weeks until the body adjusts itself to the unusual amount of fat and the diminished carbohydrate. The proportions are then changed to 2:1. The sodium nitroprusside test for the ketone bodies appears in the urine, but the burgundy red color of the ferric chloride test is negative until the proportions of the diet are increased to 2½:1. This and subsequent changes to 3:1, 3½:1 and even 4:1 are made at one to two week intervals. The tests of the urine give checks of how well the diet is being followed. In nearly all instances it is necessary to increase the diet to the proportions of 4:1 before the symptoms completely disappear. This can usually be done in two months time. The patient is kept on the diet until he is free from symptoms for six months. The diet is then gradually relaxed by increasing the carbohydrate ten grams at a time and reducing the fat in corresponding amounts so that the total food intake contains the same number of calories. These changes are made until the child is on a normal diet with a limited amount of carbohydrate. Candy and other sweets must always be excluded from the final diet.

In some stubborn cases, a short period of carefully controlled fast is also employed to reinforce the effects of diet, but such a procedure is not desirable in the majority of cases. It should be avoided when possible.

In the preparation of the diet, certain needs must be supplied in order to keep the child healthy. The total amount of food given must be enough both to prevent loss of weight and allow for normal growth. Since growth is continuous during childhood, the amount of food will have to be increased every few months. The minimum caloric requirements can be estimated by adding 50 per cent. to the basal metabolism<sup>5</sup> for the expected weight, but it is often necessary to give more to active children.<sup>6</sup> The protein must also be supplied in amounts that will allow for repair and growth. In the majority of instances, the requirements will be fulfilled if one gram of protein is given for every kilogram of the expected body weight (weight for the height). The patient should be weighed at least once a week to be sure that he is not losing weight for lack of food. If he loses below the average weight for his height, more

calories must be given until normal rate of growth has again commenced.

Twenty-four hour amounts of urine should be examined at intervals and the protein (nitrogen) excretion from the body quantitated. A negative balance takes place when more protein is excreted than is taken in the food. If this should happen over a long period, the health would eventually suffer. In most instances, however, the amount of protein recommended is sufficient to prevent this. All my cases except one have had protein retention.

The fat and carbohydrate content of the diet can then be calculated from the following formula:

$$\text{Total Calories} = 9 \times R (C + P) + 4C + 4P.$$

The following example shows the type of diet given to a girl nine years old, 51 inches tall, weighing  $61\frac{1}{2}$  pounds (28 kilograms). The minimum total caloric needs were 1600 calories. She was given slightly more than one gram of protein per kilogram of weight, as she was growing rapidly. The first diet, the proportions of which were  $1\frac{1}{2}$  grams of ketogenic food to 1 gram of antiketogenic food, contained carbohydrate 60 grams, fat 137 grams, and protein 31 grams. The diet list given to the patient to follow is shown as follows:

During two months she was worked up to a 4:1 diet, which contained carbohydrate 9 grams, fat 160 grams and protein 31 grams. A copy of this diet is shown as follows:

#### Diet 4:1:

Carbohydrate, 9 grams.  
Protein, 31 grams.  
Fat, 160 grams.  
Calories, 1600.

	C	P	F	Total Calories
Breakfast				
1 egg .....	..	6.	6.	78.
30 grams 40% cream...	1.	1.	12.	116.
10 " bacon .....	..	1.6	5.	51.
60 " grapefruit .....	2.	1.	..	12.
36 " butter .....	..	..	30.	270.
Bran cakes .....	..	..	..	...
Cocoa shells .....	..	..	..	...
	3.	9.6	53.	527.

#### Dinner

	C	P	F	Total Calories
Broth .....	..	..	..	..
30 grams lean meat....	..	8.	5.	77.
60 " 5% vegetables ..	2.	1.	..	12.
30 " 40% cream ..	1.	1.	12.	116.
32 " butter .....	..	..	26.6	240.
10 " olive oil .....	..	..	10.	90.
D-Zerta .....	..	..	..	...
	6.	19.6	106.6	1062.

#### Supper

Broth .....	..	..	..	..
60 grams 5% vegetables ..	2.	1.	..	12.
30 " 40% cream ..	1.	1.	12.	116.
34 " cheese .....	..	9.	12.4	148.
35 " butter .....	..	..	29.1	262.
	9.	30.6	160.1	1600.

#### Diet $1\frac{1}{2}:1$ :

Carbohydrate, 60 grams.  
Protein, 31 grams.  
Fat, 137 grams.  
Calories, 1600.

	C	P	F	Total Calories
Breakfast				
15 grams Cornflakes....	11.8	1.1	..	52.
20 " bacon .....	..	3.3	10.	105.
60 " 40% cream ..	2.	2.	24.	232.
180 " grapefruit or	..	..	..	..
90 " 10% fruit ..	6.	3.	..	36.
15 " butter .....	..	..	12.5	112.
Bran cakes .....	..	..	..	..
Cocoa shells .....	..	..	..	..
	19.8	9.4	46.5	537.

#### Dinner

Broth .....	..	..	..	..
18 grams lean meat....	..	4.8	3.	46.
120 " 5% vegetables ..	4.	2.	..	24.
60 " 40% cream ..	2.	2.	24.	232.
120 " grapefruit or	..	..	..	..
60 " 10% fruit ..	4.	2.	..	24.
22 " butter .....	..	..	18.3	165.
2 Uneedas .....	10.	1.	1.	53.
D-Zerta .....	..	..	..	..
	39.8	21.2	92.8	1081.

#### Supper

Broth .....	..	..	..	..
120 grams 5% vegetables ..	4.	2.	..	24.
60 " 40% cream ..	2.	2.	24.	232.
15 " cheese .....	..	4.	5.5	65.
16 " butter .....	..	..	13.3	120.
3 Uneedas .....	15.	1.5	1.5	78.
	60.8	30.7	137.1	1600.

A knowledge of dietetics is necessary to carry the diets out successfully. The food must be so proportioned at each meal so that the ketogenic-antiketogenic ratio is the same throughout the day. Each patient must understand that it is essential to eat all the food prescribed at every meal, otherwise the ratio will be upset. Substitutions of food should not be allowed unless specifically stated, because only foods with exact equivalent compositions can be used. The diabetic scales are an essential part of the equipment. All food should be weighed out accurately, according to the prescription.

The diets should not be changed too rapidly, because the large amount of fat will upset the digestion if sufficient time is not given for adjustment. The general health of most of the patients on the diet improves. Sallow, muddy complex-

ions, even those with acne, have cleared up. In some instances constipation is relieved and two or three natural movements are passed daily. In others constipation requires treatment. The excess of fat has been well tolerated, even in patients who were said to be unable to take fat. In practically no instances has it caused any digestive symptoms, except when the diet is changed too rapidly. In one or two instances there has been one day of nausea during the period of adjustment, but in no case was it necessary to stop the diet or give any special treatment.

Constipation, if present, should be treated with laxatives that are free from sugar. The following is a list of those which may be used:

- (1) Plain granular agar-agar.
- (2) Various Mineral Oils.
- (3) Diabetic or Plain Petrolagar.
- (4) Salts (Carlsbad or Epsom).
- (5) Bitter fluid extract of Cascara.

Some cases do better if a dose of salts is given regularly once a week, while others seemed to be harmed by this procedure.

Fatigue, worry, and mental irritation should be avoided. The best results are obtained when these are eliminated. One hour rest should be taken daily.

Since milk, one of the main sources of calcium, is nearly eliminated from the diet, and since calcium excretion is increased during an acidosis, it is well to supplement the food calcium by calcium in some other form. Our routine is to give two to three teaspoons of calcium lactate daily with the meals. It is very soluble in water and may be so given, or it can be mixed with the food. Copious water drinking is desirable to ensure free elimination. A minimum of six to eight glasses of water should be drunk daily.

Although only a limited amount of table salt is allowed on the food, no restrictions are placed on its use in cooking. It has not had any harmful effect on the action of the diet, and has made the food much more palatable.

Luminal and bromides are not necessary when the diet acts successfully, and are always omitted in children. Adults are allowed to continue their use as they feel the need of them, but are encouraged to gradually reduce the dose until they feel

it can be omitted. Neither drug has any beneficial effect on the diet.

**SUMMARY.** The ketogenic diet results in complete symptomatic relief of the epileptiform symptoms in at least 33 per cent. of children, and it is followed by definite improvement in nearly three-quarters of the cases. Results are equally good in petit mal and grand mal. They are less satisfactory in the adult than in the child.

The preparation and use of the diet requires a technique and precautions similar to those used in the dietetic treatment of diabetes. The accuracy with which it is followed can be checked up by tests for acetone in the urine.

The diet must be increased up to a ratio of 4 (ketogenic) : 1 (antiketogenic) in the majority of cases before the best results are obtained. This is followed by a very marked ketosis. After freedom from attacks for six months, the amount of carbohydrate is gradually increased and the fat decreased until in the case of the girl shown above a diet containing 100 to 150 grams of carbohydrate is allowed. In no case should candy or other sweets be given. Excessive amounts of sweets are followed by attacks.

<sup>1</sup>Hoeffel, G., and Moriarty, M. E.: "The Effects of Fasting on the Metabolism of Epileptic Children." *Am. Jour. Dis. Child.*, 28:16, (July) 1924, and Shaw, E. B., and Moriarty, M. E.: "Hypoglycemia and Acidosis in Fasting Children with Idiopathic Epilepsy." *Am. Jour. Dis. Child.*, 28:583, (Nov.) 1924.

<sup>2</sup>Talbot, F. B., Metcalf, K. M., and Moriarty M. E.: *Am. Jour. Dis. Child.*, 33:218, 1927, and *Boston Med. and Surg. Jour.*, 196:89, 1927.

<sup>3</sup>Wilder: "The Effect of Ketonuria on the Course of Epilepsy," *Mayo Clinic Bull.*, 1921, p. 307. Peterman: *Am. Jour. Dis. Child.*, 28:28, 1924. Helmholtz: *Am. Pediatric Soc. Trans.*, (May) 1927 (unpublished).

<sup>4</sup>On a 1600 caloric diet, this would be carbohydrate 184, protein 31, fat 62 grams; 1½:1 diet, carbohydrate 61, protein 31, fat 137 grams.

<sup>5</sup>Talbot, F. B.: *Physiol. Reviews*, (Oct.) 1925.

<sup>6</sup>The weight used in these calculations is the average weight for the height.

<sup>7</sup>The method used in calculation can be found in Talbot, Metcalf and Moriarty—*Boston Medical and Surgical Journal* 196, Jan. 20, 1927. Luther: *The Modern Hospital*, May, 1927. A very simple practical calculation table giving diets containing 1000 to 2500 calories has been devised by Drs. Luther and Bartlett and printed by the Massachusetts General Hospital.

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### III CASES OF CANCER OF CERVIX TREATED WITH RADIUM.

CASE NO.	LESS THAN 1 YR.	1 YR	1 1/4	1 1/2	1 3/4	2 yrs	2 1/4	2 1/2	2 3/4	3 yrs	3 1/2	3 3/4	4 yrs	4 1/4	4 1/2	4 3/4	5 yrs	Over 5 yrs.	NOTES
1																		8 1/4 years	Died Uraemia No Cancer
2																			No Cancer
3																			Died Uraemia No Cancer
4	Lost																		
5																			
6																			
7																			
8																			
9																			No Cancer
10																			
11																			
12																			
13																			
14																			
15																			
16	Lost																		
17																			
18																			
19																			
20																			
21																			No Cancer
22																			No Cancer
23																			No Cancer
24																			No Cancer
25																			No Cancer
26																			Cancer Probably Present
27																			No Cancer
28																			
29																			No Cancer
30																			No Cancer
31																			No Cancer
32																			No Cancer
33																			No Cancer
34																			
35																			No Cancer
36																			No Cancer
37																			No Cancer
38																			
39																			
40																			
41																			
42																			Cancer Present
43	Lost																		
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63																			No Cancer
64																			No Cancer
65																			No Cancer
66																			No Cancer
67																			No Cancer
68																			No Cancer
69																			No Cancer
70																			No Cancer
71																			Cancer Present
72																			No Cancer
73																			Result of Radium
74																			No Treatment
75																			Ca Fundus Stump Treated with Radium
76																			No Treatment
77																			No Cancer
78																			No Cancer
79																			No Cancer
80																			No Cancer
81																			No Cancer
82																			No Cancer
83																			No Cancer
84																			No Cancer
85																			No Cancer
86																			Cancer Present
87																			No Cancer
88																			No Cancer
89	Lost																		No Cancer
90																			Died Pneumonia No Cancer
91																			No Cancer
92																			Cancer Present
93																			No Cancer
94																			No Cancer
95																			Recurrence following simple hysterectomy
96																			No Cancer
97	Lost																		No Cancer
98																			No Cancer
99																			No Cancer
100																			No Cancer
101																			No Treatment
102																			No Cancer
103																			No Cancer
104																			No Cancer
105																			No Cancer
106																			No Cancer
107																			No Cancer
108																			No Cancer
109																			No Cancer
110																			No Cancer
III																			No Cancer

44 OF THESE FAR ADVANCED DIED IN LESS THAN 1 YEAR

11 ALSO ADVANCED DIED IN 1 YEAR

6 LIVING AND NO CANCER PRESENT OVER 4 YEARS

9 LIVING AND NO CANCER PRESENT OVER 3 YEARS

3 LIVING WITH CANCER PROBABLY PRESENT OVER 3 YEARS

8 LIVING AND NO CANCER PRESENT OVER 2 YEARS

2 LIVING WITH CANCER PROBABLY PRESENT OVER 2 YEARS

2 LIVING AND NO CANCER PRESENT OVER 1 1/2 YEARS

1 PATIENT DIED OF URAEMIA FREE OF CANCER AFTER 8 YEARS

1 PATIENT DIED OF URAEMIA FREE OF CANCER

# 79 CASES OF CANCER OF CERVIX TREATED BY OPERATION.

OPERATIVE DEATHS	LIVED LESS THAN 1 YR.	1 YR.	1-2 YRS.	2-3 YRS.	3-4 YRS.	4-5 YRS.	Over 5 Yrs.	NOTES
1 X								
2 Lost								
3								
4 Lost								O Recurance Death after 8 Years
5 X								O Well 16 Years
6								
7 X		X						
8 X			X					
9								O Died of Shock after 12 Yrs.
10								O Well 11 Yrs.
11 Lost								
12 X			X					
13						X		
14								
15 Lost								
16 X								
17 X								
18 X			X					
19 Lost								
20 X								
21 X								
22								O Well 16 Yrs.
23								O Died CA of SIGMOID after 15 Yrs.
24 X		X						
25 X								
26 X			X					
27 Lost								O Well 14 Yrs.
28								
29 Lost								
30 Lost								
31 Lost								
32 Lost								
33 Lost								
34 X								
35 X								
36					X			
37 X								
38								
39								O Well 12 Yrs.
40 Lost								O Well 12 Yrs.
41						X		
42								O Well 11 Yrs.
43 X								
44 X		X						
45 X								
46 Lost								
47 Lost								
48 Lost								
49 X		X						
50 X								
51 Lost								
52 Lost								
53								O Well 9 Yrs.
54 X								O Christian Scientist
55 X								
56								
57 X								
58 Lost								
59 Lost								
60 X								
61 Lost								
62								O Well 7 Yrs.
63								O Well 7 Yrs.
64								O Well 7 Yrs.
65			X					
66								O Well 7 Yrs.
67					X			
68 X								
69 X		X						
70								O Well 7 Yrs.
71								O Well 7 Yrs.
72								O Well 6 1/2 Yrs.
73 X								
74					X			
75 X								
76 Lost								
77 X	X							
78								
79						O		

16 DIED FROM OPERATION

21 LOST TRACK OF

14 DIED IN 1 YEAR OR LESS

19 LIVED FROM 5 TO 16 YRS. FREE OF DISEASE

1 HAS LIVED OVER 4 YEARS FREE OF DISEASE





## CANCER OF THE CERVIX\*

HERMAN C. PITTS, M.D.

Cancer of the uterus is one of the most frequent forms of cancer. It comprises about 15% of all cancers, and in women constitutes some 30%. Cancer of the cervix is the most frequent type of cancer of the uterus, and occurs in 90% of cases. The fact that the majority of women have had one or more pregnancies perhaps determines the greater frequency of cancer of the cervix. At any rate, it is perfectly evident that it occurs most often in parous women and that neglected lacerations and chronic cervicitis generally precede the development of cancer.

The growth shows itself in two forms, the squamous celled and the adeno-carcinoma, determined by the site of origin. The cervical canal to the external os is lined with columnar epithelium. There are many glands lined with the same type of epithelium running deep into the tissues. Cancer starting anywhere in this gland area, is of the adeno-carcinoma variety. On the other hand, the vaginal portion of the cervix is covered with stratified epithelium, and cancer beginning there is of the squamous celled type. The age incidence is the usual one for all types of cancer. That is, it appears most often in the latter half of life when the tissues are all undergoing degenerative changes. The large majority of our cases are between 40 and 60 years old. The youngest case was 22.

The experience of many men has shown that cancer in women under 30, tends to recur very promptly. Surgery is of little benefit. The growth recurred in a woman of 28, after the most thorough type of operation, before she could leave the Hospital. Dr. John G. Clark of Philadelphia told me of a similar case in his own practice and vowed he would never again attempt surgery for cancer of the cervix in a young woman.

The early symptoms of cancer of the cervix are so well known they hardly need be mentioned. I said, "symptoms"; I might say, "symptom," for there is really one and only one symptom of any moment in the early stages, and that is irregular bleeding. The bleeding may be slight, so very slight as to be nearly overlooked. It may follow

coitus or straining at stool or any unusual exertion. The fact that this bleeding does occur is the important thing and its occurrence demands an immediate, thorough examination. Every single member of the medical profession in Rhode Island must know these things, and yet you would be surprised, I am, by the number of patients presenting just such symptoms who are tolled along with promises and pills for weeks and months without even being examined by the men to whom they trust their lives. Laziness or indifference, I am not sure which it is, perhaps more of the former than the latter. I do know, however, that the medical profession at large has a responsibility to these patients that is not being met. Sometimes I think the American Society for the Control of Cancer had best spend its energies on the Doctors and let the public alone! That doesn't mean that the public also is not responsible for our failure to get cases early. Their failure is due to pure ignorance. And the most grievous ignorance lies in the belief that every woman must bleed irregularly and profusely at the time of the menopause. If we could only uproot that belief; if we could only educate all women to realize that irregular or profuse bleeding at any time is a danger signal, we would have accomplished much toward alleviating the suffering from cancer of the uterus.

The growth in the cervix shows itself in two quite distinct forms: either as an ulceration or a proliferation. The ulcerating type begins as a hard nodule that later breaks down, or as a small ulcer that gradually extends until the whole cervix is replaced by an extensive crater with hard edges and a friable sloughing surface that gives off a foul discharge and bleeds profusely on touch. The proliferating type shows itself first as a budding out of mucous membrane into a sort of polyp. This gradually enlarges until the whole upper vagina may be filled with a friable cauliflower-like mass that also bleeds profusely and gives off a bloody, foul discharge.

Extension of cancer of the cervix is in one of two ways—either by direct invasion of the parametrium or by way of the lymphatics to glands near the uterine vessels or at the bifurcation of the common iliacs. Obviously, cancer arising in the cervical canal will invade the parametrium rather quickly, while on the other hand, the proliferating, cauliflower type travels in that way

\*Read before the Rhode Island Medical Society March 3rd, 1927.

much more slowly and, as we have found, is much more amenable to treatment. On the other hand, I am quite certain the ulcerating squamous celled type metastasises to the pelvic glands quickly and is not so often cured even when the local result of treatment is perfect. Let it be understood that I use the term "cured" advisedly; we never really consider a cancer patient cured. We can truthfully say they are well for 5 years or more, perhaps, but being cured is a different thing and until we know more of what cancer is, and of what its cure involves, we are not justified in using the term.

I might say here what I have to say as to the nature of cancer. If we consider cancer an entirely local disease, then cancer of the cervix is one of its most favorable forms to treat. Remove the local disease by any means one sees fit and the disease is really and truly cured. This we know is not easily accomplished, even in the very earliest case. That cancer is a local disease appears to me from observation and experience in treating it, entirely illogical. I am much more willing to consider it a local expression of some constitutional fault. Just what that fault is, remains to be discovered. Until that happy day comes it must be our endeavor to get cases early and to eradicate the local disease in the most thorough manner possible.

The methods in use for accomplishing this have been various. Some 50 years ago, Dr. Byrne of Brooklyn used the actual cautery. By carefully coning out the cervix, he was so far successful that he was able to report a fair series of so-called cures. In our own day, Percy has used long applications of less extreme heat in an effort to kill the more vulnerable cancer cells and leave the healthy tissue undamaged. Although in his hands the results were encouraging, other men who have tried the method have given it up as unsatisfactory. Operative methods have been and still are extremely popular. Vaginal hysterectomy is perhaps the safest even yet, and for many years while abdominal technique was being perfected, it certainly was. Not that it ever was or ever can be made the most satisfactory from the point of view of "cures," and still a certain number who are so operated upon remain well for years. As can be seen very readily, the growth must be attacked in its very earliest stages to make vaginal hysterectomy possible at all.

In an effort to increase the scope of operation in cancer of the cervix, Wertheim of Vienna, devised and practiced one that was extremely radical and thorough. Through the abdomen, the uterus, tubes and ovaries, all the parametrium, and as much of the vagina as possible were removed. He, at first, advised dissecting out the gland areas lying at the bifurcation of the iliac vessels, but later gave this up as being too hazardous. To accomplish this wide removal, he dissected the ureters free on each side throughout their course in the pelvis. The operation is difficult, primary mortality is high, and complications following it, numerous. Certainly it should not be attempted by one not thoroughly practiced in pelvic surgery. On the other hand, no other single operative procedure gives as large a percentage of five year "cures."

Coming now to the latest of practical methods of treatment, we have Radium, seconded by X-ray. It is not known why Radium and X-ray act on cancer tissue as they do. We do know that these agents affect different growths very differently. Some are much more resistant than others. Only recently a man who is in a position to know, gave it as his opinion that the more cellular and consequently more malignant growths, were much more successfully treated by radiation than by operation; operation in most of them being followed by prompt recurrence.

The method of application of radium is the important thing. And the most important thing in that, is not to over treat. Overtreating is sure to be followed by a tremendous breaking down of tissue with the formation of an extensive crater. This crater is slow to heal and its infected, sloughing walls are ideal for the production of what is probably an entirely new cancer.

Every clinic develops its own technique. Ours is as follows: Platinum needles of varying lengths and containing 2 or 3 mgms. of Radium, are inserted into the growth in the cervix or into the parametrium, when the growth has extended that far, and are allowed to remain in place from 72 to 96 hours. In addition we are apt to place 100 mgm. filtered by silver, brass and rubber, in the cervical canal for from 12 to 15 hours. The advantage of the platinum lies in the fact, that it stops or filters out the beta or burning rays and allows only the hard gamma rays to enter the tissues. On that account, even after a four day ap-

plication, the tissues show no necrosis and there is no breaking down as there would be if steel needles for instance, were left so long. Generally in two weeks after treatment the cervical tissues look nearly normal. If we see a continued, marked improvement, we do not treat again and are content with a thorough application of heavy X-ray front and back. If on the other hand, the disease is evidently not eradicated, we repeat, being careful not to overdo at this second treatment.

Treatment of cancer of the cervix by any means at our command today, is unsatisfactory and discouraging. We have many, many days when we feel our efforts are wasted. Then, perhaps, several patients come back after several years of excellent health, and we are distinctly encouraged by feeling that at least, some out of the many have been helped.

During these years we have used Radium, we have been looking for some agent that injected into the patient's body, will increase the action of Radium and X-ray. So far, we have tried many things without result. Whether we are justified in our hope that such an agent can be found is perhaps doubtful. Nevertheless, we must keep on, looking forward to the day of accomplishment.

#### NOTE

The accompanying charts show, first a comparison of results between operation and treatment of cancer of the cervix with Radium and, second give a more or less graphic picture of what we have been able to do for the first 111 cases coming to the Cancer Clinic. We have included in this series, three cases of cancer of the body of the uterus where, for some reason, a complete hysterectomy was not done, and where a heavy dose of Radium was given in the stump of the cervix immediately after the supra-cervical operation. Two of these cases have remained well, while a third died from extension to the iliac glands with no demonstrable growth in the cervix.

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#### PRENATAL PROBLEMS\*

By PAUL APPLETON, M.D.

PROVIDENCE, R. I.

Prenatal care is not a new subject, but it is an all important one. For the serious obstetrician, the care and observation of the patient during

pregnancy is a compelling obligation, and while less spectacular, full as necessary and important as delivery.

The mortality of obstetrics is not decreasing. This is a startling but established fact, resulting from searching investigation by governmental commission and the appointed committees of Medical Societies. The conclusions of these agencies unanimously agree that the only way to decrease this mortality is by better, more careful, and especially by universally practiced prenatal care. The public is rapidly absorbing the educational propaganda of good medical thought and is responding with more enthusiasm than we might expect in their demand for better and safer obstetric practices.

The bulk of the responsibility must therefore be laid directly upon the Medical Profession. It is unfortunate that there are still a tremendous number of practitioners who, doing a considerable amount of obstetrics, make no pretense of prenatal care. This is either from ignorance or carelessness or both. We have repeatedly taken care of patients, who at a previous confinement were in supposedly competent hands and yet have had little or no study during pregnancy. Even blood pressure readings are a new experience for them and pelvic measurement unheard of.

These considerations, based on fact, lead me to again bring this important subject to your attention and to emphasize our responsibility for careful painstaking and thoughtful study of the prospective mothers under our care.

My paper will not discuss much of the usual routine procedure of pregnancy care. I came before this society with a previous paper on this subject. But today I would like to call your attention to some of the interesting side lights and unusual phases.

First, let us consider the mental side of the patient. She comes to us not as a test tube to a laboratory, but as an individual. She must be guided and treated as an individual and not as a hypothetical case. She has some real misinformation. She has many questions uncertain in her mind. She has fear. These matters must be sought out and cleared up,—all of which takes

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\*Read before the Rhode Island Medical Society at the Annual Meeting, June 2nd, 1927, and supplemented by motion pictures by the author.

time and unceasing patience. It is well worth it, and will help tremendously in our management of the case.

Get interested in the patients life, her medical and social history, her ambitions, her ideals, and her attitude towards prospective motherhood. Emphasize her loyalties. Minimize her distrusts. Take away her burdens of worry and anxiety, and imbue her with optimism. She cares little for the diplomas on your wall. She knows little of your training, but she absorbs your personality, your sympathy and your kindly guidance. She can be led into an attitude of co-operative effort and her entire pregnancy and labor too, will be colored by this mental state. I know of no human experience where the doctrine of psycho-physical parallelism is more aptly demonstrated. One must of course be guarded in prognosis and one must interpret physical signs truthfully, but one may and should minimize groundless fears.

One of the difficulties in handling these patients is the bridge-table advice that she gets from her neighbor. There are as many modern popular notions as there are old wives tales, less superstitious in character but just as depressing to the introspective patient, and let me emphasize, that pregnant women are more introspective than they will ever reveal. Search out these mental neoplasms that are causing anguish to the worrisome patient and extirpate them with a well chosen word of scientific fact to disprove, or radiate them with emanations of optimism. Patients may forget our skill, but they do not forget the milk of human kindness.

In advising the patient, positive suggestion is far more effective than negative command. "You may do the ordinary things of life always with temperance and common sense" is a better way of advising than to say "You must not do this and you must not do that." Do not make an invalid out of your patient unnecessarily by limiting too much her usual mode of living, her habits, her diet, and exercise or by proscribing normal work and normal recreation.

Concerning her habits, they deserve some attention. I do not regard cigarette smoking as a pretty attribute to the expectant mother, but I do not forbid it. The Pediatrists suggest that it limits the future nursing ability and that opinion warrants advising the patient to limit the habit.

In these arid days when alcoholic sources of supply are unreliable, I believe that the cocktail habit is potentially dangerous, and the patient should be warned not so much against the cocktail as its ingredients. Radiance to add to the joy of living should be obtained otherwise.

I firmly believe, that present modes of dress among our patients are a tremendous advance in the hygiene of pregnancy. Pelves are no longer deformed by tight corsets, and a superabundance of petticoats no longer constricts the growing foetus. Our patients reach the childbearing period better able to perform their physiological function. I no longer advise patients for or against the maternity corset. The woman used to corsets will be more comfortable with one, but her sister unused to such restraint will be as comfortable without. A supporting binder or girdle will often produce some comfort.

There seems to be a widespread opinion both medical and popular, that high heeled shoes are in some way detrimental to the health of women. No less an authority, than the late Doctor Robert W. Lovett, the eminent Orthopedic Surgeon of Boston is my reason for advocating the high heeled shoe in pregnancy. By tending to throw the patient forward thereby changing her centre of gravity, she is forced to stand and walk more erectly, throwing back her shoulders and preventing round shoulders and other postural spinal curvatures. This tends to prevent tilting of the pelvis and favors the gravitation of the presenting part to enter the patient's pelvis. These shoes also give better support to the arches of the foot, already overtaxed by the increasing weight of the patient. I commend this matter to your attention.

Dietary restriction is ill advised in early pregnancy. The patient is usually very hungry and often has unusual food desires and appetites. I believe in a full free diet, and in satisfying those naive cravings so often manifested, on the basis that they represent a metabolic demand of one kind or another, too complicated often for the physiological chemist to interpret. Later in pregnancy, perhaps the last three months, kidney irritants are to be restricted lest the overloaded renal system rebel, and toxemia supervene. Again while there is little experimental evidence, in spite of much research on the matter from all angles,

I cannot help feeling that clinical experience warrants the assertion that a restricted diet does have some effect in keeping down the weight of the child. This I feel is important. When we congratulate a mother upon the birth of a child weighing over nine pounds, we are in reality congratulating her upon certain, though not always evident, maternal damage.

History taking is important, and care is essential. Detail to the point of exhaustion is ill advised. No patient is impressed by the game of "Ask me another" in your office. It takes but a short time to get a skeleton history of the pertinent features bearing upon the problem of childbirth. The story of previous pregnancies, labors and puerperia is important as is that of gynecological experiences and trauma resulting in possible pelvis deformities.

It is fair to state that the average patient is a well woman and considers herself so. The majority will say that "They never felt as well before." That is the normal. But grading all the way from this to comparative invalidism are train upon train of symptoms. Some important, some trivial. We must analyze these and treat them appropriately. I would like to speak of a few definite symptoms.

Fatigue is so constant in early pregnancy that I consider it almost as pathognomonic. In over a hundred consecutive cases in private practice extreme fatigue and lassitude in the first twelve weeks of pregnancy was a constant symptom and so noticeable to the patient that she volunteered the information, although the question was studiously avoided. I regard it as the first subjective symptom of pregnancy,—more constant than breast or bladder symptoms. I have many times made a tentative diagnosis of pregnancy on this sign of lassitude alone, without any supporting evidence and in every case even in those illegitimately pregnant, subsequent events have confirmed the diagnosis. It is often strikingly observed before a menstrual period has been missed. It is a very reliable diagnostic point.

Psychic disturbance is to some degree always present in pregnancy. Not always a depression. Sometimes a definite euphoria. It is so well known that it deserves little comment save this interest-

ing observation, that almost all psychic disturbance fades away gradually during the last three or four weeks, so that even minute evidences of psychic disturbance are absent at term. A psychosis that is present when the patient reaches term is to me an ominous sign and the patient will bear watching after delivery lest she develop a true puerperal insanity.

The cardinal signs of pre-eclamptic toxemia are well known. Albuminuria, hypertension, headache, nausea, oedema, epigastric pain, and retinitis with choked disc. Many cases show only a few of these signs, and any one of them is significant and should not be overlooked. Toxemia going on to eclampsia may occur with an essentially normal urine. Of course it is rare, but dependence upon urinalysis alone is a dangerous practice.

There are innumerable other symptoms which though laboratory proof is absent, must be regarded as toxemic in origin, and of great or little importance in direct proportion to the presence or absence of other cardinal signs.

Some of these symptoms not necessarily of dangerous prognostic import, are nevertheless extremely difficult to treat. In any case an anti-toxemia regime should always be instituted. Prominent among these are the various skin rashes, most atypical from the ordinary rashes of Dermatology. They may be on any part of the body and vary from hyperemias to true hyperplasias. Some are progressive. Some are evanescent with remissions and recrudescences. None are permanent but will clear up shortly after delivery. The itching is sometimes terrific from these lesions and should be treated actively.

Gingivitis, or inflammatory conditions of the gums is a rare but interesting symptom. A recent case occurred in which the teeth of the lower jaw were completely enshrouded by the gums, which had to be trimmed back on two occasions before the completion of pregnancy. After delivery, the trouble abated rapidly.

Granulations of the eyelids have occurred in a few patients under my observation. These had the appearance of a crop of pedunculated pigmented moles of the size of the head of a pin and occurred on the skin surface of the lids. They

disappeared promptly after delivery, to recur at a subsequent pregnancy.

Ptyalism, is a very disagreeable symptom. I have now under my observation a patient, now at term in her second pregnancy. The salivation has been continuous since the onset of pregnancy and has been most intractable to any form of treatment. It begins at mid-day and lasts until well into the night. One day's actual measurement amounted to a secretion of 19 fluid ounces of saliva. This patient under constant care and observation has at no time showed other signs of toxemia. I am confident however that it is a metabolic disturbance and in that sense toxic, and I have no doubt that it will clear up shortly after delivery. Apparently that was the story during her last delivery, when the patient tells me she had the same troublesome symptom.

The examination of the patient should be made in an unhurried way, systematically with a clear idea as to what the findings mean, basing them upon a common sense interpretation of their relation to pregnancy or delivery. This examination should be thorough. The patient respects thoroughness for she appreciates that her attendant is more valuable to her in proportion to his fidelity in physical observation. Any pathological findings should be repeatedly watched for progress or results of treatment. Consultations help tremendously in interpreting dubious findings, and patients regard consultation as a strength not a weakness, on the part of their attendant.

Just a word about blood pressure. Of course, its regular observation is synonymous with good prenatal study. It is remarkable how little the blood pressure of the patient changes throughout her pregnancy, so that any marked rise in comparison to her observed normal, regardless of any arbitrary limit, should call for painstaking search for other symptoms of toxemia and their interpretation regarding the gravity of the situation and its treatment.

Pelvimetry is perhaps the most important part of prenatal examination. It is an accurate vital check on one of the prime determining factors of the patient's mechanical ability to deliver. The

measurement of pelvis is a good habit, easy to acquire and does not involve expensive or complicated apparatus. Why so many practitioners otherwise careful, look upon this as a difficult or unnecessary procedure is hard to comprehend. There is nothing mysterious or ultra scientific about it. If one cannot measure pelvis accurately, he is not doing his duty to the patient and should inform himself on this simple and vital matter. It is uncompromisingly essential that anyone undertaking an obstetric case should be thoroughly versed in this metric method and capable of interpreting the findings.

The change in body weight of the pregnant patient is of some significance. During the first three months, the weight is stationary or shows some loss, but during the last six months the patient gains about a pound a week. There is a good deal of scientific observation to support the contention that excessive gain in weight is almost a sure sign of toxemia, probably expressed as occult oedema. Another interesting point, and this has been frequently borne out in my own experience, is that in the last three or four days of pregnancy, instead of a gradual increase there is a sudden change to a loss of weight amounting to about a pound daily. Many patients today possess bathroom scales of considerable accuracy, and where these are available one can, with the co-operation of the patient keep a daily weight chart. When the peak has been reached and a sharp drop is noticed, the prophecy that labor is at hand is usually correct. There is a very valuable sign of impending labor.

In conclusion, may I emphasize that when a patient goes into labor, there is nothing more satisfactory to the attendant than, having made a really careful study of the case from all angles, physical, and psychological, he approaches the responsibility of her delivery with confidence and comfort. That confidence is contagious and is mirrored in the solace and equanimity of the patient as she faces her travail.

Adopt this obstetrical slogan, "Adequate prenatal care pays health dividends to mother and baby."

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## EDITORIALS

### OF CERTAIN POLICIES

It may be of interest to those who have favored us with their patronage in the way of advertisements, to understand something of the policies of the RHODE ISLAND MEDICAL JOURNAL; we are advancing the following for the better understanding of our advertisers that our mutual benefits may be the better appreciated.

Rhode Island is, in population a compact state—the most densely populated state in the Union and therefore reaches many buyers in a small buying area; we have nearly eight hundred physicians, many hospitals, together with a number of allied health organizations and associations; not only does the JOURNAL reach all of these, collectively and individually, but every state medical society in this country and severals others, and many prominent scientific libraries of the world. Our JOURNAL is not cumbersome, it is sufficiently attractive as a scientific publication to claim a

gratifying attention and while we might load many additional pages with advertising matter, only the expense of publication is sought. We therefore circumscribe our acceptances of advertisements to usually two of kindred nature and have repeatedly declined others. Furthermore these advertisements must measure up to the standard that we make every endeavor to maintain, and the business or commodity advertised must be of a character that is beyond the pale of suspicious scrutiny; all of which means that our advertisers have the advantage of an exclusive privilege somewhat rare in the advertising world.

And now to the point.

It has been frequently suggested and often urged from various sources that we introduce complimentary notices or reading matter bearing upon commodities (whose excellence is already accepted) advertised in our columns but inasmuch as to favor one and refuse another, this may not be. We appreciate the business given us; we are thankful for it. We are grateful;—but in all fairness we may not buy it upon these terms.

The RHODE ISLAND MEDICAL JOURNAL gives full equivalent for value received.

of people are carefully prepared and presented by representative medical men. The programmes, the efforts of representatives of State Public Health Boards, the U. S. Public Health Service and the Schools of Research and Sanitation attached to the large New England universities, obviously represent all that is best and new in public health work. The list of topics was varied and was handled by over sixty individual papers. An interesting factor of the Providence meeting was the interest shown by physicians themselves—this is most desirable and stimulating to the group of less technically trained professional workers who carry out the actual daily contacts with people. Such a movement as this Health Institute appeals to educational authorities as well as the medical fraternity, and the use of the R. I. College of Education and the R. I. Medical Society Buildings on Francis Street, made an admirable center for the activities of the four days.

It would appear that this annual Institute has a real reason for its existence, that it is showing a very remarkable growth and doing an excellent piece of work, all of which are prime reasons why it should have the firmest support of the medical profession at large.

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#### THE NEW ENGLAND HEALTH INSTITUTE

The meeting of the New England Health Institute recently held in Providence was gratifying to its sponsors and especially the local members of the various committees. It was extremely well attended by interested visitors from all parts of New England. Having its beginning four years ago in Hartford, Connecticut, annual meetings have been held in Boston, Portland, Concord and Providence.

The Institute aims to instruct and stimulate the interest of a modern but rapidly growing group of professional workers, active in public health affairs, social service and education, in so far as it deals with health and sanitation. In order to pass on the results of scientific investigation to the great mass of the lay public, such an educational movement as this is of the greatest value. The unbiased opinions of leaders whose activities do not often bring them into contact with large numbers

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#### "REPORTABILITY"

Quite recently most physicians of this state received a notice regarding the "reportability" of venereal diseases together with a somewhat elaborate questionnaire to be filled out for each case. It must be admitted that thus far the medical profession has failed to realize that reportable and compulsory reporting are in the minds of the health authorities, one and the same thing and that physicians are required to report their cases. This in the main they have not done and some medical men are suspected of having sent Wasserman specimens under an assumed name. They wish the inestimable knowledge of the precise nature of the patient's condition but do not wish his name to be known by anyone.

This may be explained in several ways but the most likely is that physicians consider such cases as the very essence of professional secrecy and feel that the matter is between the patient and himself. Another and perhaps no less important rea-

son is that the physician knows full well that if he questions his patient too much and takes down too many notes said patient will not continue his treatment and certainly not if he knows his name is to go on record at the State House. Much might be written pro and con.

It is to be assumed that with very rare exception each and every M. D. will assist health officers and bureaus of vital statistics in every way possible for, to do otherwise would be incompatible with our noble science, but such an intimate and private matter as this is perhaps not for record notwithstanding a law which is not and perhaps cannot be enforced. It is one thing for a physician to certify that in a certain period he has had under his care a certain number of cases of syphilis,—it is another for him to certify that John Doe has it. From earliest time the doctor has enjoyed the confidence of his patient, it may be doubted if patients will confide in their physician if they know it is to be made a matter of record. Furthermore, the question might be asked as to the benefit to society were this ruling followed and all cases reported. Perhaps it would be interesting to know how many cases there are, it certainly is impossible at the present time to calculate how many deaths are caused by venereal disease or their sequelae as it is only occasionally that they are given as the cause on death certificates. The immediate rather than the underlying cause is reported. But the same thing is true of pulmonary tuberculosis, the cause of death being given as pneumonia or some other rather than the true or remote cause, and for the reason that sundry insurance would be invalid or somebody's feelings injured. By and large the assumption is possible that the worthy cause of public health will very probably remain unsatisfied in this particular and that private health will continue to receive the very best attention the medical profession can bestow.

pices of the State Health Departments of Connecticut, Massachusetts, Maine and New Hampshire. The six New England State Health Departments are responsible for the Institute; with the cordial assistance of, and affiliated with, the United States Public Health Service, the Public Health School of Yale, Harvard, Biological Department of Massachusetts Institute of Technology, and Simmons College, Boston. The sessions last about four days, and usually cover all the principle features of public health work.

The session recently conducted by the State Board of Health of Rhode Island aroused wide interest. Sixty-seven specialists read papers, and as fifteen minutes was allowed for comments on each paper, there was much discussion.

The attendance was good, approximating six hundred. From the number of well known workers in various fields of public health contributing to the program, it would be impossible to indicate those whose papers proved to be of greatest interest. Special mention, however, could be made of Dr. W. H. P. Faunce, President of Brown University; the five men assigned to the Institute by Surgeon-General Cumming of the Public Health Service; our own Doctor Chapin; Doctor Godfrey, Epidemiologist of New York; Dr. Howard A. Streeter, Health Officer of Manchester, N. H.; Prof. Aycock of Harvard; Prof. Frederic P. Gorham of Brown University; Dr. Frank Richardson of Brooklyn; and Prof. Young of the State Health Department of Michigan.

The Chairman of the Program Committee, Doctor Gleason, Director of the State Department of Child Welfare, was successful in securing the assistance of twelve able chairmen of the sections.

Entertainment provided was very carefully planned. Tea was served by Miss Mary Gardner to the nursing group. Mr. Luther Burlingame arranged for visits to several of our industrial plants. A luncheon was provided for the visitors by the Gorham Manufacturing Company. Visits were made to the new Water Works Plant of the City of Providence, and a luncheon and clinical demonstration were arranged for by Dr. Harry Lee Barnes at Wallum Lake. Interested private individuals and State Departments loaned automobiles for the transportation of guests on the various trips.

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#### THE HEALTH INSTITUTE OF NEW ENGLAND

The New England Health Institute recently held in Providence proved to be one of outstanding value and interest. This was its fifth session, previous meetings having been held under the aus-

Most gratifying of all was the very cordial cooperation and assistance by many members of the Rhode Island State Medical Society and the public press.

The next Institute will be held in 1928 in Vermont, and the question has arisen as to whether or not the Institute will continue its sessions after that time. I am firmly convinced that it should not be terminated. We have many public health problems in common in the New England States, some of which are not of especial interest to the country as a whole.

Most of the speakers presented their subjects by the use of notes, and it will, therefore, be impossible to publish their interesting addresses. Some, however, read manuscript papers, many of which I hope to secure that they may find a place in later issues of the Rhode Island Medical Journal.

Respectfully,  
B. U. RICHARDS, M.D.  
Commissioner of Public Health

## SOCIETIES

### PROVIDENCE MEDICAL ASSOCIATION (PROVIDENCE DISTRICT SOCIETY)

The regular monthly meeting of the Providence Medical Association was held at the Medical Library, 106 Francis Street, Monday evening, October 3, 1927, at 8:45 o'clock with the following program:

1. Pernicious Anemia and its Treatment. Dr. Guy W. Wells.
2. Typhoid Meningitis in a Baby two months old. Dr. Panos Dukakis. Providence City Hospital.

The Standing Committee approved the following application for membership:

DR. ARCADIE GIURA  
PETER PINEO CHASE, M.D.,  
Secretary

## HOSPITALS

### THE MEMORIAL HOSPITAL

Meeting of the Memorial Hospital Staff held October 6, 1927:

Meeting called to order by President Wheaton at 9:15 P. M. Record of attendance taken. Record of previous meeting read and approved.

Dr. Wheaton reported on a change in the method of receiving case reports.

Dr. Wing reported on ways and means to entertain members of Staff at meetings. Discussion opened by Dr. Hammond. Readings of the MEDICAL JOURNAL, or of items of interest in each special department would be of assistance.

Motion passed that method of entertainment be left in the hand of committee of which Dr. Wing is chairman.

Dr. Hammond gave a very interesting talk on "Osteomyelitis."

Meeting adjourned at 10:00 P. M.

JOHN F. KENNEY, M.D.  
Secretary

## MISCELLANEOUS

### THE ANTITOXIN IN THE SERUM

We speak of antitoxic serums, or antiserums, as the equivalent of antitoxin; but the serum simply contains the antitoxin, and along with it certain other ingredients that it has been the object of biologic research for the past thirty years to get rid of. These are, so far as known, albumins and euglobulins. The former have been separated, to a large extent, from the antiserums, but the antitoxic principle is very closely linked with a globulin or a pseudoglobulin so that separation of these has been found extremely difficult.

The albumins and euglobulins are believed to be responsible for the serum sickness and serum sensitiveness that sometimes follow the use of antiserums.

An absolutely pure antitoxin has yet to be developed, but the analytic work of the pioneers in biologic therapy has at last succeeded in simplifying the problem to a certain extent. Certain diphtheria antitoxins now being offered are concentrated and the freest from all objectionable features that have been heretofore supplied. It is almost water-white in its purity, and contains a minimum, perhaps the irreducible minimum, of albumins and euglobulins.